Water Supply and Management Alter Temperature and Oxygen Patterns in the Henry's Fork River and Island Park Reservoir

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The Henry's Fork Foundation, a conservation non-profit for the Henry's Fork of the Snake River in Eastern Idaho, utilized long-term high-frequency data collection to better understand key temperature and oxygen patterns in the Henry's Fork and Island Park Reservoir system, and what those patterns may mean for sportfish habitat availability.

We found reservoir drawdown for irrigation supply affects downstream water temperature to a greater extent than climate variables such as air temperature and solar radiation. Examining seventeen years of continuous water temperature data found a 0.15°C (0.27°F) increase in average water temperature in the Henry's Fork for every 5% reduction in Island Park Reservoir volume. Three years of weekly in-reservoir thermal profiles show high reservoir drawdown eliminates cool hypolimnetic (bottom-layer) water in the reservoir, allowing warm epilimnetic (surface-layer) water to pass into the tailwater resulting in the observed temperature increase in the Henry's Fork. The loss of the hypolimnion also reduces kokanee salmon (Oncorhynchus nerka) habitat within Island Park Reservoir, more so than deep-water dissolved oxygen reduction resulting from eutrophication.

Thus, reservoir drawdown is an important variable for fish habitat, growth, and survival in the Henry's Fork and Island Park system. Reservoir drawdown is controlled by water supply from snowpack and water demand from downstream irrigation water rights holders, and so improving water quality and fish habitat in the Henry's Fork River and Island Park Reservoir depends on collaborating with water rights holders to reduce Island Park Reservoir drawdown.